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POULTRY IN PENNSYLVANIA.

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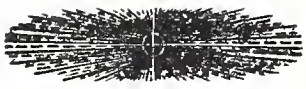


PREFACE.

Harrisburg, Pa., March 24, 1906.

It is doubtful whether anything the farm yields has a more varied use in making up the dietary of all classes of our citizens, than the products of the poultry-yard. It is remarkable how many things that go upon the table of a family, accustomed to good living, are made up in part, at least, of eggs. The custards, the puddings and the cakes, as well as some varieties of salads, all contain a fair proportion of eggs. Besides all these uses, every family that can afford it, will frequently have eggs in some one of the many forms in which they may be prepared for the table, in their bill of fare. The hotel or restaurant that fails to have the item "Eggs as ordered" in its menu, will receive but little patronage.

It is no wonder, therefore, that the demand for eggs is increasing more rapidly than the supply. Large quantities of eggs are brought to the United States from other countries every year, and many thousands of dollars are thus being allowed, annually, to slip away from American farmers that might just as well be secured by them as not.

Many farmers think that poultry raising and egg production are matters of too small importance to engage their attention; but if a close account were kept of the many baskets of eggs that find their way from their homes to the country store or the village grocery, and if they were made to realize the part these eggs play in keeping down the family grocery bill, it is quite likely they would come to regard the subject in a different light.

For the encouragement of those who realize the importance of the poultry industry, and in the hope of getting others to give this industry a small share, at least, of the attention to which it is entitled, this Department arranged for the preparation of this bulletin by an expert poultryman, who is in the business, not as many "Poultry Fanciers" are, for pleasure merely, but for the handsome profit he derives from it.

N. B. CRITCHFIELD,
Secretary of Agriculture.

POULTRY IN PENNSYLVANIA.

By T. E. ORR, Beaver, Pa.

The poultry product puts a goodly sum into the pockets of Pennsylvania farmers—about fifteen million dollars annually; but when it is known that the State of Pennsylvania consumes five times as much poultry and eggs as it produces, it becomes us to devote some time and thought to poultry conditions and poultry prospects in our Commonwealth.

Six states west of Pennsylvania surpass it in the products of the hen, Ohio and Iowa leading with twenty million dollars' worth each. Pennsylvania, with more individual land owners than either of these states—almost every plot enumerated being capable of yarding and feeding a few hens—should not be behind any one of these six states.

The high price of corn in the Keystone State may preclude the possibility of producing five cent pork, at a profit. The numerous dogs kept by foreigners in our mining and manufacturing sections may make it impossible to profitably produce fine wool at thirty cents per pound; but corn is not the first essential in the production of poultry and eggs, and the cur dogs that abound in our foreign settlements do not interfere seriously with hens, except in the food they consume.

These same foreigners teach us many valuable lessons on the economical and profitable keeping of fowls. Where not too closely crowded together by our over-grasping corporations, these thrifty foreign housewives—especially among the French, Bohemian and Irish—are quite sure to have a half-dozen or more hens that produce eggs for the use of the family at a very small cost, for the cash outlay for their feed is very meagre indeed.

Perhaps no better place than this will be found in this Bulletin to make a few observations on the following subject:

LESSONS TO BE LEARNED FROM VILLAGERS.

Notwithstanding his many advantages, the average farmer does not manage his poultry so well as does the average villager. The following are some of the apparent reasons for this condition of affairs:

1. The average farmer looks upon the hen and her affairs as too small and insignificant to command his attention. He grows his grains in wholesale quantities, and likes to sell them the same way. If he makes a specialty of any kind of live stock it is something large—horses are his size, or beef cattle. But it takes four years from the time one starts to breed horses or beef cattle before he has anything

to sell. Sheep or swine begin to give returns sooner, but with these, too, it is two or three years before he can hope to have any income, not to mention a return of his original investment. Dairy cows bought ready for business, is the only class of live stock that can in any way compare with the hen in bringing prompt returns.

The villager, on the other hand, has no room to breed horses and cattle. His near neighbors will not allow him to keep hogs, so he is limited to the dairy cow and her coadjutor, the dairy hen. He may need to pay high prices for his feed because he buys in small quantities, but he buys what he finds yields him a profit, and dealing with small affairs in a small way he gives these small friends of ours, the hens, the detailed attention they need. The average farmer would profit by following his example, and by learning not to despise small things.

2. The average farmer expects his hens to shift for themselves, to get their food where they can find it, and to be satisfied with what they pick up as waste about the farm. Now, we claim for the hen that she is one of the best waste savers on the farm, that she can come nearer to gaining a living on the farm without interference with others than any other farm animal. But that is not the way to keep hens up to the highest profit, even on the farm.

The average villager is compelled to keep his hens confined, so as to protect his neighbors' gardens in spring and summer; the late fall and winter are the only seasons they are allowed their full liberty. He knows that to do their best work he must buy much of the green food that the farmer's hens pick up summer and winter, and he balances this partial ration with corn, wheat, oats and bran in such a way as to make his hens producers of eggs at least ten months in the year. He does not follow the example of the farmer—feed them corn alone from October first until Christmas, simply because that is the time of corn-harvest and corn is easier supplied than any other grain.

3. The average farmer thinks that any old house is good enough for hens. He condemns and berates them, to the very verge of blasphemy, because they get into the feed-boxes of his horses and roost on his farm machinery or the family carriage; but he seldom so far forgets his prejudice as to build suitable quarters for them.

A clergyman recently told me this incident: He drove into the country to visit one of his parishioners known to be quite close in money matters. He found him just finishing quite a respectable poultry house and expressed some surprise that he should make such an investment.

"Well, Parson, it was this way: About a month ago I had a note coming due for $160, and I could not raise the money. I told wife I guessed we'd have to give a mortgage for $200 to raise the money. 'I guess not,' said she. 'You give me your note for $160, bearing interest, and I'll let you have the money.'

"I was too surprised to ask her where she got it, but that night I did ask her, and do you know she had saved up $240 of chicken money the past two years, besides buying the groceries and her own clothes? Parson, I just got her to make that note $240 and I've built her a hen-house that has cost $80, and I'll pay it all back to her, too. I'm ashamed to say that for years I've refused to build her a decent house in which to keep the chickens."

Now, the average villager knows that he must keep his hens controlled, and respect for appearances compels him to build a decent-looking house, so at the same time he builds one that is comfortable. Further on we shall give some plans for poultry houses suitable for either country or village.

The success of villagers also proves that hens do not need a wide range in order to be large egg producers. In fact, if hens must devote most of their time and energy in searching and working for their food they are not likely to reach large egg production. They need the most of their physical and nervous forces to manufacture eggs, thus converting the raw material into the finished product.

4. The average farmer will rarely supply the variety of food that the hen requires to do for him a profitable business. The average villager, on the other hand, knowing that he must buy all that she consumes, will usually provide not only a liberal variety of grains, but also the little oddities—green food, meat, bones and grit—so dear to the appetite of the fastidious hen. Instead of feeding her for weeks together on corn or oats exclusively, he takes pains to alternate these grains and to use others in such a way as to stimulate the hen's appetite to the largest possible consumption of food. This is absolutely necessary to a large production of eggs.

5. The average villager surpasses the average farmer in the detailed attention he gives his hens. He sees them earlier in the morning and later at night. He studies their individual characteristics and peculiarities more closely. He watches their developments more carefully and keeps a more accurate record of what they do. In other words, he gives them more attention, gives them more credit for what they do and expects more from them. These are the lessons that our farmer friends should learn from the villagers.

PENNSYLVANIA OFFERS A PROFITABLE MARKET.

We have already stated that the Keystone State consumes five times as much poultry and eggs as she produces. Of course, Pennsylvania does export something toward the East, but a mere trifle compared with what she imports from the West. There is a single wholesale grocer in the city of Pittsburg who handles an average, daily, of three hundred cases of eggs of thirty dozen each. He pays out for these eggs about a half-million of dollars each year. How many Pennsylvania farmers participate in this handsome sum of money? Not one. Every egg that this man handles comes from Indiana where careful buyers gather them from the farmers. He says: "The farmers of Western Pennsylvania do not produce enough eggs, especially in winter, for me to bother with. Of course, I'd rather buy home eggs, but I must buy from people who have eggs to sell."

The above-named egg-buyer pays good prices. He handles fresh eggs only. He has no use for storage eggs. He would pay higher prices if he could get a constant supply of nearby, fresh eggs. From September 1 to March 1, a period of six months, the wholesale Pittsburg prices will average thirty cents per dozen for strictly first-class eggs.

It has been demonstrated again and again that the man who can produce eggs at all in this district in these six months, does so at

a food cost of not over ten cents per dozen. In what other line of animal industry can one find a larger margin to pay for the labor and interest on the cost of investment?

Eastern Pennsylvania demands even a better quality of poultry and eggs at still higher prices. The better class residents of Philadelphia and New York are each year becoming more fastidious as to the quality of the poultry products they consume, and less careful as to the prices they pay, provided the quality is above reproach. Not only in the two cities named, but in a dozen smaller cities, are people who contract for their eggs six months at thirty cents per dozen and six months at forty-five cents, just to be sure they get eggs that are strictly first class.

In every town of five thousand population, or larger, are people who would be glad to pay close to the above named prices, provided they could be sure of getting a regular supply between September and March. Anybody can supply eggs in the spring. The time to make your contract is in September, but be sure that you can "deliver the goods" before you sign up your contract. It requires an artist to secure a steady supply of eggs in the fall and winter. He who can do so will have no trouble in holding his customers at much above the market prices in spring and summer. If he "makes good" in winter they will stand by him in summer. It is the chief object of this Bulletin to help farmers in Pennsylvania to produce eggs in fall and winter.

Again, Pennsylvania is furnishing a constantly increasing demand for more table poultry of first quality. One has only to loiter around some of our commission houses to learn that most of the dressed poultry consigned will not rank above third class; that first-class poultry sells more readily and for twice as much money as poultry that grades only third class. It is also the object of this Bulletin to increase the amount of first class poultry produced by the farmers of Pennsylvania.

A woman of my acquaintance has been supplying fresh eggs and dressed chickens to the best families of a Western Pennsylvania town for a dozen years. She assured me that during six months of each year she never sells an egg for less than two cents and during the remaining six months for never less than three and one-half cents. Her uniform price for dressed chickens is twenty-five cents per pound, and she assures me that there are families that have not failed a week in three years to take from her at least two dozen of eggs and one chicken. She has constantly on her "waiting list" families anxious to get their supplies from her. She goes to town every Tuesday and Friday of the year, and she so manages her flock that each market sees her ready to supply not less than twelve dozen eggs and not less than ten dressed chickens. Her poultry flock brings her an income of more than $1,500 per year, and it is not a large flock, either.

Well, how did this woman get her trade and how does she hold it? Simply by learning how to produce a first-class article and by never marketing an egg or a chicken that she cannot guarantee is up to her high standard. She is as independent in her business as a nabob. With her surplus eggs in spring and summer she usually takes on a few extra customers; then when her supply steadies down

in the fall she drops from her list any old customers who are inconvenient to serve or who are not prompt to pay.

Could she hold her customers year after year if she supplied them with eggs, some white and some brown, some very large and some very small, some clean and some dirty? Not at all. They would at once guess that she had a mixed flock—all sorts huddled together—or that she was a huckster, buying her eggs wherever she could pick them up cheapest. She delivers her eggs with a uniformity of color and size that pleases her customers and makes them believe that "Mrs. Jones' eggs are different."

Could she hold her trade on dressed chickens if she marketed them in bad condition, some yellow and some white, some fat and some lean, some neat and some mussy? Not at all. She studies the wants of each customer. She knows that Mrs. White always wants a fat, plump, yellow chicken that weighs about four pounds, while Mrs. Crawford prefers one a little larger, but not so fat. She wraps each chicken neatly in a package by itself and pins on it a bit of paper with the name of the customer for whom it is intended. Mrs. Jones tells me that she has customers who would not fail to take a chicken every Friday in the year whether they always wanted it or not for fear of so offending her that she would drop them from her list. That is the way to cultivate independence! The poulterer who can always deliver first-class goods does not need to coax for customers. They will be hunting for him if he has a reputation to sustain, and sustains it.

Said a reliable commission merchant not long ago: "The trouble with many farmers is they do not study the demands of the market. They take little trouble to learn the difference between a first-class article properly packed, and a third-class article poorly packed. Our anticipations are often raised by the description of a consignment said to be en route, only to be sadly shocked when it arrives and we find that it is so poor in quality and so mixed and mussed that we have hard work to dispose of it at any price. The high grade goods is always the kind that pleases us, pleases our customers and for which we can return a prompt remittance that will please the consignor."

THE FOUR MOST SERIOUS DIFFICULTIES.

The greatest obstacles that now stand in the way of profit from poultry on Pennsylvania farms seem to the writer to be properly classified under the following headings. Mixed Flocks, Poor Houses, Injudicious Feeding and Careless Marketing. Each of these topics is of sufficient importance to justify a separate bulletin, but we shall attempt to condense our suggestions on these and a few side lines so as to come in a practical way within the limits of this publication.

1. AVOID A MIXED FLOCK.

If it were my duty and privilege to double the poultry product of the Keystone State within three years, I should not begin by attempting to double the number of hens on each farm. The first step would be a grand reduction. "Fewer birds, but better, and all as much alike as possible," would be my motto. If on any farm one-half or more of the hens gave evidence of being high grade or pure blood of

some particular variety—the best dozen or twenty young hens of that variety would be selected, as foundation stock, and every other hen and particularly every male chicken on that farm would be fattened and marketed at once.

Did you ever study the possibility of twenty hens when worked up to the limit of their capacity? The average hen in Pennsylvania produces only seventy-one eggs per year—less than one egg each five days. There are many hens in this State that produce two hundred eggs per year, hence some hens must produce less than fifty eggs each. My first aim would be to bring those twenty best young hens up to an egg production of one hundred and eighty eggs each, or an egg each alternate day. Of course, I should fail, but if I reached the one hundred and forty-two mark with half of them and the one hundred and three mark with the other half, I should have brought this little flock seventy-five per cent. above the average Pennsylvania hen, and selection, housing and feeding should have the credit for this. Their egg product at twenty-four cents per dozen would give an income of $2.44 per hen.

The average Pennsylvania hen lays her seventy-one eggs mostly in the spring and eighteen cents per dozen is above the average price received for her egg product. This gives the egg income from her as only $1.09. Our smaller flock, better bred, better fed, better housed and so cared for as to do their best work in the fall and winter will easily give us the larger income above mentioned. Their food cost may be larger, say $1.24 each, but that gives us a profit over food cost of $1.20 each, while the average hen, now, with a food cost of say 83 cents, gives us a profit of only 20 cents above food cost.

The next step with our flock of twenty young hens would be to get the largest and best returns from them during the first breeding season. We have now in this experiment a flock on each farm in which each specimen looks very much like every other one. If the flock remaining on the first farm looks quite like high grade or pure bred Barred Plymouth Rocks, we have a flock that will command our attention and likewise the admiration of passers-by. The marketing of the white, brown, black, streaked and speckled hens and especially of the various colored "roosters" was "good riddance to bad rubbish." These twenty best hens have a chance for their lives now, as well as for the respectability of their offspring.

If they are high grade or pure bred Barred Plymouth Rocks, I should supply, as their "crower," about the middle of the winter the best, well matured and well marked cockerel of this variety I could find. If I knew a man who could make me believe that he had line-bred his birds for years with an eye single to vigor, size and shape typical of this variety, and that he had a cockerel whose mother was an extra good egg producer; that this bird was further a good individual free from any serious defect as to comb, eye or shank, he would have no trouble in getting me to pay $5 for him, and if my twenty young hens were more than ordinarily good Barred Plymouth Rocks, I'd readily part company with $10 for such a cockerel, remembering that "the male is half the flock."

Those twenty females have possibly been running a month or two without any male mate. They have laid just as many eggs, and far better eggs on this account. Not sooner than the first of

February I'd put in with them this new cockerel. By this time the females would be reasonably safe from contamination by the mongrel males recently marketed, and in ten days or less we could begin saving eggs for hatching, feeling sure that every chick would be sired by the new cockerel. We should hatch as many chicks as possible in March, April and May—none later.

What is the possible product of these twenty young hens from February 10 to May 10—90 days? If properly cared for their egg product should be 900 eggs. These, if carefully set either under hens or in incubators should hatch 500 chicks of which 300 should live to the age of ten weeks. Then we should begin selling the males from the earlier hatches for broilers. They will bring as much money in April, May and June, weighing one and one-half to two pounds each, as they will when twice as large as roasters, and this early marketing saves risk, feed and, what is of more importance, room for the pullets. By the middle of August no cockerels should remain unless the broiler price got very low. In that case separate the late cockerels as soon the the sex can be determined and force them along rapidly for roasters or capons. At any risk separate them from the hens and pullets.

About the middle of June your hens—those twenty best young hens —will be through with their broodings. Soon they will begin to look seedy and see the necessity of laying egg work aside in order to make their fall clothes. Sell them at once. They will bring fifty per cent. more now than if kept until Thanksgiving, and they will hardly pay for their feed in eggs if you have pushed them during the winter and spring. Don't keep them at a loss. Sell them now.

If that fine cockerel proved a treasure, if his chicks showed great uniformity of shape and color, and if that shape and color was uniformly good, keep him, but give him a place by himself or a run with the cockerels. Don't let him run with the hens after you quit setting eggs.

Now push your pullets along to rapid maturity. You want them to begin laying as early in the fall as possible. The March and April hatched pullets, if well bred Plymouth Rocks, should begin laying in October; if Wyandottes or Leghorns they should begin a month or six weeks sooner. If Brahmas or Cochins be thankful if you get any eggs before Thanksgiving. Keep up a constant lookout for the handsomest pullets and mark these for your breeding females next year. If these finest in shape and color lay among the earliest, so much the better. but pick them out into a separate bunch and don't let them lay too much in the fall. They have shown their style, beauty and willingness to do business; don't allow them to do too much. Keep them growing. Next February is the time you will call on them to do their best.

In July you will build your houses, we hope on the plans we give in this Bulletin, as many others have done to their own satisfaction. By this time you will have decided how largely you wish to become an advanced breeder of poultry and will know how much house-room you will want for next winter. Do all your building not later than August. A house built later in the season is scarcely a safe place in which to keep fowls the following winter.

From your three hundred chicks you should have raised one hundred and twenty-five, perhaps one hundred and fifty pullets. Sup-

pose you wish to keep forty breeding hens—twice as many as the previous winter. You will do well to erect a house large enough for one-hundred. In this way you can keep your second best fifty pullets laying well into the winter. Having selected and separated your best fifty, from which to select your choicest forty later in the season, cull out and sell your thirty to fifty poorest specimens as soon as you can determine that they are the poorest. Your second best fifty will give good egg returns well into the winter, and will then sell well, either alive or dressed. Never sell at Thanksgiving time on the open market. That is when everybody sells and prices are lower than at any other time in the year.

THE SECOND SEASON'S BREEDING.

You now come to the time that your nerve and your faith will be fully tested. Remember that we started out to double Pennsylvania's poultry product in three years and that we are to close our contract with a nice uniform flock of some one good, useful variety on each farm. Our experiment started in December. Let us keep forty breeding females this second season. By all means keep them in two flocks entirely separate, though they may be in adjacent compartments of the same house. Better still, if your farm buildings are separated that you have two houses each near a different barn, where each flock can have unlimited range yet run no possible risk of getting mixed with the other flock.

If that high-priced cockerel we used proved to be a particularly strong breeder, and the pullets all seem to be particularly good, select the twenty whose coloring and shape best suits this purpose and mate them back to their sire. The chicks of the second season will thus contain seventy-five per cent. of the blood of this one bird and only twenty-five per cent. of the twenty best young hens with which you started. If this male bird was all he should be your second flock of chicks from this sire will be quite uniform in color. If he had any serious defects these defects will probably be greatly intensified. In this case our second step in line breeding was a serious mistake.

For a mate of your other twenty females, provided your last year's cockerel was what his breeder claimed him to be, go back to the same fancier and tell him you want another cockerel of the same strain, but not too closely related to the first one—say a first cousin or a second cousin of his. Still better, if he can supply it, get an uncle of the first cockerel. Under no circumstances breed this bunch of twenty pullets to one of their own half-brothers. He is likely to be a full brother to some of them.

THE RESULTS OF THIS GRADING.

It seems unnecessary to go further into the details of this method of quickly grading up a mixed flock. Of course, a better way to get a flock of pure bred fowls is to purchase a flock or breeding pen. or trio from some reliable breeder, or to purchase a few settings of eggs. Of these methods we shall speak later. But to quickly bring a mixed flock up to a reasonable degree of uniformity and to keep it paying a profit all the time, there is no way better than the one outlined.

If your original twenty females were themselves pure bred, and if your top crossing male used the first two seasons was himself a success, you should be able to select sixty females containing seventy-five per cent. of his blood for your third season's breeding that are fine specimens. If, I say, those original twenty hens were good ones and the second male used the second year with your second best twenty pullets, each containing fifty per cent. of the blood of that first cockerel, you should be able to cross breed these two lines with safety and success. If in any doubt about this crossing, do not hesitate to go back for more males from the same fancier. Do not throw away what his line of blood has done for you by going to some other fancier for males. This thing of "fresh blood" is one of the most successful fakes that has ever been perpetrated on the poultry public. Only one other has been more abused—that of "pullet matings and cockerel matings."

In all this matter of eliminating the mixed flocks, bear in mind that we are not working to make fanciers of the farmers of Pennsylvania, (although we know of no people who would make better fanciers, or have a better right to be fanciers), but our object has been wholly to secure a larger, better and more marketable product of poultry and eggs for commercial purposes. It is the basket of eggs all alike as to size, shape and color that always brings the highest price. It is the crate of chicks looking "as much alike as peas in a pod" that always brings the top price in the market. People will stop and examine them, will note the address on the tag of the shipper and send back to him for more. It is the uniform flock on your farm that attracts the passer-by and makes your place famous. You never stopped to buy a cockerel for a breeder, or eggs for hatching, from a mixed flock, and you never will.

The writer lays claim to considerable familiarity with poultry conditions all over the country. He has spent much time in studying these conditions, and he is quite positive in his convictions that only those are making a profit on poultry in a commercial way who are breeding pure-bred fowls or those of a high grade of some particular variety. This is the basis of his plea for a uniform flock, and if the flocks we find on our Pennsylvania farms are so common and mixed in appearance as not to indicate a preponderance of any particular blood, the sooner the entire flock is dispersed and another of some of our leading pure blood varieties is installed the better.

SELECTING A NEW VARIETY.

If then the sample high grade or pure bred flock of Plymouth Rocks, or some other good variety, does not exist on the farm, let us proceed to build up a flock that suits our business and our fancy. This is not difficult to do, for in the more than one hundred pure bred varieties we have a wide range from which to select. Neither does it take long to establish a flock, for fowls mature much more quickly and multiply much more rapidly than do even our sheep or swine.

The first step in selecting a variety is to study your market. Let no one, however, be prevented from beginning, because of remoteness from one of the great cities. Railroads and express offices are found in nearly every neighborhood in Pennsylvania—in many places

two of each, so as to make competition. Despite the wail "monopoly," a first class article of poultry or eggs will always pay its own way to market and leave a handsome margin. The man in Western Pennsylvania who produces as many as two cases of eggs each week can deliver them to the door of his customer in New York city by express for two cents per dozen. But as already stated, there is a good market for first class eggs and poultry in every town and city in the State, and the man who is starting would better cultivate a nearby market.

Another thing to consider is this: Does your chosen market call for any particular quality of poultry or color of eggs, and is that call so loud that it will pay you to give the people just what they fancy? If they are willing to pay an advanced price for either white or brown eggs, for either yellow-skinned or white-skinned poultry, then by all means cater to their demands. But if their tastes and demands are not very decided, then make your own choice in these matters, and by always furnishing a uniform article, educate them up to your standard. The demand for white eggs and white-skinned fowls is fully established in New York city, and they pay more for these characteristics. Boston, on the other hand, demands yellow skinned fowls and brown eggs. Tastes are divided on these points in Philadelphia, while in Pittsburg and other cities in the western end of the State, color cuts but a small figure, so there is a uniformity in each package of either one color or the other.

The Mediterranean varieties—all Leghorns, Minorcas, etc.,—lay a uniformly white egg. The White Leghorn is the great egg producer for the New York market, and the cockerels are sold as broilers at good prices there, so soon as they reach the weight of one pound each. There is no doubt that these Leghorns are great egg producers, but they do their best laying in the warm months. Only the most carefully constructed houses will secure a regular supply of winter eggs. The large pendulous combs of all Mediterranean hens make them easy victims of frost. Again, the fact that these Mediterranean fowls do not furnish a good quantity or quality of meat, except as squab broilers, and the further fact that they do not hatch or rear their own young, thus compelling the use of incubators and brooders, handicaps them pretty heavily for the man who is starting in to produce a combination of poultry and eggs.

The extreme opposites of the Mediterranean varieties are the Asiatics—the Brahmas, Cochins and Langshans—those large fowls with heavily feathered shanks. They lay dark-colored eggs. They are slow of maturity, but some strains of the Light Brahmas and Black Langshans lay a good many eggs. A tendency to broodiness is their worst fault as egg producers. The Brahmas and Cochins have yellow skin. The Langshans have a pinkish white skin and despite the popular prejudice against their black plumage, they are a very superior table fowl. More and more the Asiatics are becoming fancy fowls, less and less are they being selected as money-makers in commercial lines.

The Polish varieties, the Game varieties and the Hamburg varieties are now classed as fancy, rather than utility fowls, although the Hamburgs, if properly handled, do produce a great many eggs. This brings our line of choice for farm purposes down to the French, English and American breeds. Of the French, only the Houdans

are numerous enough in this country to be well known. Like all the French varieties they lay a white egg and a good many of them. They are also possessed of a white skin and a superior quality of flesh.

Of the English breeds, only the Dorking varieties have long been known in America. Their long, low, deep bodies; their skin and flesh of the same color and flavor as the French varieties; their handsome plumage, especially of the Silver Gray variety, makes them very popular with those who know them well; but they are still a rare bird on American farms.

By all odds the most popular English breed in America, is the latest addition to the English family—the Orpington. Of quite recent origin, developed from various combinations, mostly Dorking and Cochin, they possess commercial characteristics that are quite sure to make them permanent favorites here. They range about one pound larger than the Plymouth Rocks, though standing on shorter legs. Their skin and flesh are white. The texture and flavor of their flesh is particularly fine. They are good egg producers, hatch and raise their own young. In short, for one who wishes to produce large fowls or capons, and who is willing to set his face for a time against the popular prejudice that calls for a yellow shank, we know of no breed so good as the Orpington. They come in Buff, Black and White, each color having single comb and rose comb varieties. Only the single comb varieties have been admitted to our Standard, but the other five varieties named are likely to be admitted soon. We predict that twenty years hence the Orpingtons will be one of our most popular varieties.

And now we come to the last, and by all means, the most popular family of fowls—the Americans. This family includes five breeds: First. The old time Dominiques—without doubt the oldest American variety, one of the ancestors of the Barred Plymouth Rock, an all-around good farm fowl of medium size, compact shape, hardy, active, rose comb, and raisers of their own young. Their ideal color is exactly the same as that of the Barred Plymouth Rock. The writer remembers these fowls as grown in Virginia by his grandmother "before the war," almost exactly as described and illustrated in the new Standard of to-day. We cannot understand why more of these Dominiques are not raised. They are an ideal farm fowl.

Second. The Javas. This is the second oldest American breed. They are also one of the ancestors of the Plymouth Rock. They are of the same size as the Rocks, longer and more rectangular in body than they, with their breasts carried a little higher. They were brought to their highest popularity and perfection about twenty-five years ago in New York State. They are not very popular, although they breed wonderfully true. There are two varieties—the Black and the Mottled. Both have a deep yellow skin.

Third. The Plymouth Rocks. These are found in three varieties —Barred, White and Buff. The Barred variety originated in New England shortly after the war, a variety of bloods, as already stated, being used in its make-up. On the farms of the United States there are more fowls that bear a resemblance to Standard bred Barred Plymouth Rocks than to any other one variety. This is only an-

other way of saying that in the past twenty years more farmers have tried to breed Barred Plymouth Rocks than any other variety. It is the most difficult variety to breed up to a point approaching perfection. So notorious is this fact that when the present standard of perfection was in process of construction, the leading fanciers of this variety asked for and secured a special bonus of two points in favor of Barred Plymouth Rock cocks. This variety has done more to pave the way for the popularity of pure bred poultry on farms than has any other variety. Its large size, commanding appearance and excellent commercial qualities have made it a great favorite on the farm, and only within the past few years has another variety come to the front that could compel Barred Plymouth Rocks to take a back seat in the show room.

The White and Buff varieties of this breed are also wonderfully popular, especially in show room circles. The Whites originated many years ago as sports from the Barred variety. The Buffs—as are all Buff varieties—are a "made" breed, and the tendency of nature in these, as in all other buff varieties, is to go back to either the Black or the White. The White Plymouth Rocks are becoming wonderfully popular as farmers' fowls. The prejudices of the market in favor of a fowl with white plumage, together with the energy and enterprise of its leading fanciers in putting its many merits to the front, have had their legitimate result. The same thing can be said for the leading fanciers of the Buff variety, and at the World's Fair at St. Louis more of either White or Buff Plymouth Rocks were shown than of the Barred variety.

The farmer who has a fair stock of either of these three varieties of Plymouth Rocks, or who is so situated that he can secure reliable foundation stock at moderate prices, makes no mistake in limiting himself to one of these three varieties, and if he hopes to get into high rank in either fancy or commercial circles without too great an effort, and if his location is not in the midst of the smoke and grime of the soft coal region, I would unhesitatingly advise him to choose the White variety as likely to enable him to reach his coveted position most easily.

All varieties of Plymouth Rocks are of the same size, the standard calling for the hens to weigh seven and one-half pounds, the cocks two pounds heavier. Plymouth Rock pullets should begin to lay at seven months of age, and if started before cold weather sets in, they are good egg producers in winter time. While they may not lay so many eggs as Leghorns, their egg value for the year is usually greater. Do not attempt to grow your Plymouth Rocks much above standard size. It is damaging to the style and type of the breed and always reduces egg production. Where one person calls for an eating bird above the standard size, ten will prefer one of a smaller size. The makers of the new Standard wisely put a handicap on very large size by ordering that a bird which exceeds Standard size by more than one pound should be discounted for the said excess at the same ratio as though it were under size.

Fourth. The Wyandottes. The original variety of this breed—the Silver Laced—was admitted to the standard in 1883. For ten or a dozen years several fanciers, particularly Mr. Whittaker, of Michigan, had been striving to develop a fowl that might partake of all the good points of the Plymouth Rock, might avoid some of its

weak points, might possess some original characteristics, and especially that might sail out on the sea of popularity with the same favor that had characterized the famous "boom" that had followed the bringing out of the Plymouth Rocks. In all four of these points the Wyandotte was an immediate success.

Each sex of the Wyandotte being a pound lighter than the Rocks, this made the bird more popular commercially, for then as now there are ten families to want a fowl that dresses between four and five pounds, where there is one to demand a fowl to dress between six and seven pounds. Rotundity of form in its live condition and plumpness of carcass when dressed was another feature sought and found. Quickness of maturity, either to the broiler stage at one and one-half pounds, the roaster stage at four pounds, or to the egg-producing stage, at five to five and one-half months, was also desired and secured in the Wyandotte.

No sooner was the Silver Wyandotte popularly established than other varieties, each claimed to possess the good points of the original variety, and all other good things besides, began to be heard from, and now there are eight varieties in the Standard.

The Silver Wyandotte, or Silver Laced variety, as it is often called, is a black and white bird. The breast and thighs of the male; the same sections of the female likewise her back and wings should have black feathers with large oval white centers. The hackle and saddle of the male should be silvery white with a distinct black stripe through the center. The shanks and skin should be yellow, but in this variety they are not so deep a yellow as in the Goldens, Whites, Buffs and Partridges. For three years the Silver Wyandottes won first place in the great Australian International Egg Contest. In nearly every test in which they have ever been entered they have come off victorious, and they have clearly demonstrated two things in egg production: 1. The hen that follows nature and rests occasionally by setting some will lay more eggs in a year than a non-setter. 2. The hen that makes the money for her owner is the hen with abundant plumage and close, low comb not easily affected by frost, so is able to do business in cold weather at the egg basket.

The Golden Wyandotte is exactly like the Silver in size, shape and markings, except that it is a rich golden bay color where the silver is clear white. We have not found the Goldens, or any other variety, for that matter, equal to the Silvers in egg production.

The White Wyandottes were the third variety of this breed to secure recognition in the Standard. They originated as sports from the Silvers and the first authentic information concerning them dates about 1882 or 1883—about the time the Silvers were admitted to the Standard. They soon took a strong hold upon the public, especially after their recognition in the Standard in 1888; and early in the nineties it was seen that in general popularity they would soon out-distance the original Silvers. The Whites have always manifested an ability to mature to plumpness in their fluff rather than in absorbing all their vitality in making feathers; this, and the popular favor that gives preference to a white bird for table use, has given them their wonderful popularity all over the country.

The White Wyandotte is the variety that has caused the Barred Plymouth Rock to get away from the front. This may not be true on farms to-day, but we believe it is; it is certainly true in all our

greatest shows the past three years. At the World's Fair, St. Louis, 872 White Wyandottes were shown. No variety of Rocks equalled 500 in number and both the Buffs and the Whites outnumbered the Barred variety. At Boston, New York and Chicago for several years, with the exception of one single occasion, White Wyandottes have had the leading entry. At Madison Square Garden in 1905, there were 483 White Wyandottes, just the same number, as all three varieties of Plymouth Rocks combined. Popularity with the farmers follows closely upon popularity in the show room. It is perfectly natural that this should be the case, for fanciers know that no variety can be made immensely popular that does not have back of it those sterling qualities of utility that commend them to our practical, dollar-seeking, American farmers.

The Black Wyandottes stand fourth in genealogical order. The prejudice against the color of their plumage will always handicap them; but in dirty, smoky sections their color should be credited to their advantage. Of the eight varieties of Wyandottes, we place the Blacks not lower than third in point of egg production, and as table fowls we have found them excellent.

The Buff Wyandottes in their make-up probably embrace more blood that is not Wyandotte than does any other variety. It is hard to make a buff bird of the "stay-buff" sort. Nature in its black and white has a tendency to reassert itself. Still, Buff Wyandotte fanciers have erected on this name a wonderfully popular fowl. It must have sterling merit in utility points or it could not be maintained. Next to the Whites the Buffs are undoubtedly most numerously bred. Containing quite a sprinkling of Cochin blood, we have not found them such active egg producers as the four varieties already named.

The Partridge Wyandottes were admitted to the Standard in 1901. In color they are exactly like the Partridge Cochin, hence are very handsome. They have had a strong boom on the part of fanciers, and large prices have been received for them. In table and egg producing qualities they rank very close to the Buffs.

The Silver Penciled variety in color are counterparts of the time-honored Dark Brahmas. They breed more true to color than any other of the parti-colored varieties, and in egg production we find it a close fight between them and the Blacks as to which shall stand second on the list.

The Columbian Wyandotte, in color similar to the Light Brahma, has been bred for several years with considerable care. They have recently secured admission to the Standard and are likely to become very popular. They are surely handsome fowls, and they possess more utility qualifications than do some older members of the Wyandotte family.

The Rhode Island Reds.—This is the latest family of American bred fowls to attain Standard recognition. For a dozen years egg and poultry farmers in New England have been developing this breed. More attention was given to utility than to uniformity of shape and color, so they were slow to get into the public eye. This, not because the public cares so much for show-room points as for commercial profit; but the public as well as the American Poultry Association did expect the promoters of this breed to decide among themselves as to the shape of comb and color of plumage they fa-

vored. At last the said fanciers came to see the necessity of thus agreeing. As a result the single comb varieties have been admitted as Rhode Island Reds, and the Pea-Comb variety as Buckeyes. The Rose Comb variety was first admitted as American Reds, and later at a called meeting, were laid over for further consideration, and were later admitted as Rose Comb Rhode Island Reds. Now you have their history, take your choice. We believe all these varieties to be good table fowls, likewise good egg producers. In size they are all quite close to the Wyandottes.

We have elaborated to some extent upon the merits and peculiarities of these five American breeds, firmly convinced that the Pennsylvania farmer who wishes a variety to best serve him on the road to profit will not need to go outside of the American varieties. If he does, that it will be to secure some variety of the Orpingtons. It is a matter of no little importance that he start right; not only that he select a variety that will give good returns in dollars if properly treated, but he should also have respect for the law of beauty and symmetry possessed by himself and the members of his family. Let him remember that the co-operation of each member of his household in carrying on the poultry business will be greatly to his advantage. Each should be a special advocate of this chosen variety, so it is well to please all as far as possible, in making the selection. Under no circumstances should he allow this sentiment to carry him so far as to select two varieties. No one farm is large enough for more than one variety,

2. GOOD AND BAD POULTRY HOUSES.

All expensive poultry houses are not good. One of the worst the writer remembers cost $10 for each hen it would accommodate.

All cheap houses are not bad houses. A good, comfortable house well suited to climatic conditions in Pennsylvania, can be built to accommodate one hundred hens for $100.

The following are the essentials of a good hen house as we understand the subject:

1. It must be dry. There must not be a suspicion of dampness arising from or through the ground. If you cannot be sure of this, build your house higher and put in a floor two feet from the ground. This is a good plan anyhow, for it gives your hens a nice cool, shady place in which to keep comfortable during the hot days of summer. A hen can withstand a very severe degree of cold, provided it is dry cold. 2. It must be free from draughts. To this end we insist that our houses must be absolutely air tight at the top, rear, bottom and ends. Let all your ventilation come from the front and let these openings be at least ten feet from the place where your fowls roost at night. There must be no ventilators on the roof. A hen can withstand a very severe degree of cold provided it does not come in draughts.

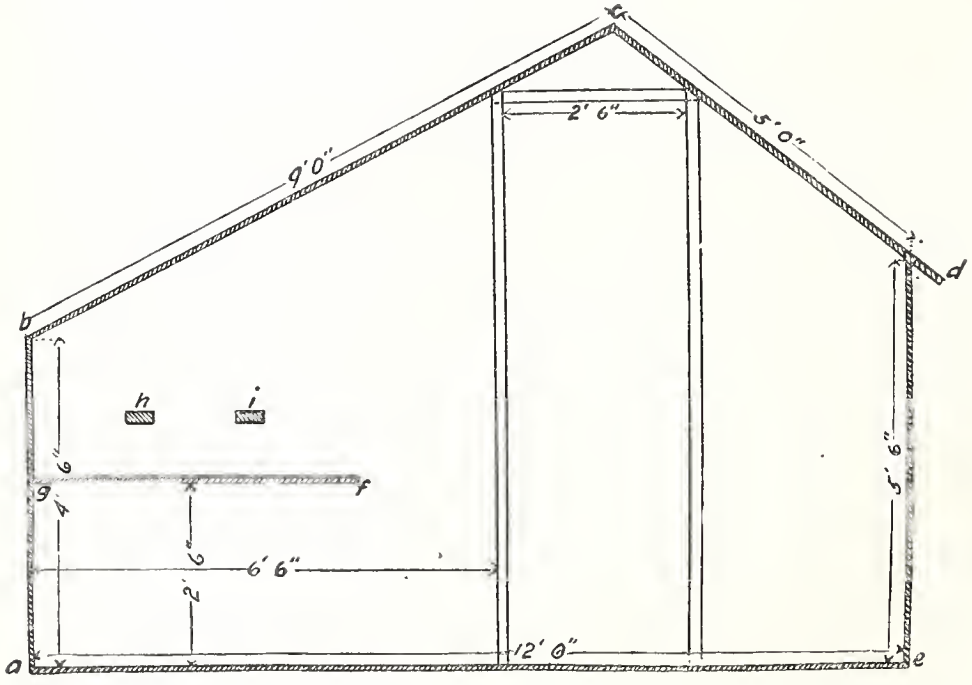
3. It must be low enough in the roof to confine the natural heat of the hens' bodies close to their bodies at night. A flock of hens can no more be comfortable in cold weather in a high roofed house than can a dairy cow be comfortable in cold weather when housed

only by a barbed wire fence. A hen can withstand a severe degree of cold if allowed to save her own bodily heat in a properly constructed house.

A HOUSE FOR ONE HUNDRED HENS.

Let it be 48 feet long and 12 feet wide 4½ feet high at the rear and 5½ feet high at the front. Cut your rear rafters 9 feet long and your front rafters 5 feet long. This will make the peak of your roof about 7½ feet high and this highest point will be about two-thirds of the distance from the back to the front—just in the right position to make the cleaning of your house, the gathering of the eggs and other necessary work the least laborious.

We give herewith an end view or a cross section of a house with the above dimensions. Let the front and rear rafters of each pair of rafters be tied with a cross beam 3 feet long and under these, both at the ends and every 12 feet from the ends, place uprights 6½ feet long and 2½ feet apart. These serve to stiffen and support the roof and also serve as door posts, for your 48 foot house should have three partitions dividing it off into four compartments each 12 by 12 feet.



Notice that there is no projection of the rear rafters. They must terminate with the outer edge of the 2x4 inch plate that runs lengthwise on top of the rear posts. The front rafters may project so as to give an eave if desired. The rafters may be either 3 or 4 feet apart, owing to the strength of structure you wish. A roof of this construction is much stronger than a simple shed roof.

When the framework is complete, cover it with sheeting. We use 16 foot boards, one inch thick, surfaced on one side. Make these sheeting boards fit smooth and snug, so there may be no breaking of the paper that is to cover them. Round off the edges of the boards

PHOTO No. 1. This shows one of Mr Orr's poultry houses, 12 x 120 feet, divided into 10 compartments, each 12 x 12 feet. Notice that the house stands nearly two feet from the ground, allowing space beneath for the hens to be comfortable in hot weather. At the time this photo was taken the front was closed so the fowls could not go under. Note the construction of this house as described on page 22.

that meet at B, also those that meet at C, so that the paper may not be broken at these important points.

If your house stands up one or two feet from the ground on posts, as we prefer to have them do, let your rear sheeting boards run clear down to the ground.

Do not try to be economical in purchasing your roofing paper; only the best is good enough and we have found the Barrett 3-ply tarred paper the best. Start with your first strip at A running up without a break over the edges B and C and on down to D, where it is turned under the edge of the eaves and securely nailed. Let the second strip overlap the first about two inches, so as to give abundant room for nailing, and continue until the entire rear wall and roof is covered. At once give it a coat of hot tar (the manufacturers of the paper furnish it and the nails too) repeat the tar six months later and once each year thereafter and this will be a good roof for twenty years.

Of course the front of the house should be toward the east or the south—the latter preferred—and each compartment should have a front window about 3 feet wide and 4½ feet high. It is well to have these windows on hinges. They may be taken off in April and replaced until December by light wire screens, also on hinges.

If your house is elevated two feet above the ground, it is well to have your under compartments each partitioned off from the others, so that when the hens from each yard go back under their own quarters they cannot mix with their neighbors.

A little exit door, about 8 by 14 inches, should open from each compartment into its corresponding yard. These should be sliding doors so you can control your flock, but ours are seldom closed except in zero weather.

At f-g in the drawing is shown the dropping board over which are the perches h and i. This dropping board is 2¼ feet from the floor, is 3½ feet wide, runs the whole length of each compartment and should be built solidly into the rear wall so there cannot be any draught of air passing down over the fowls when on their perches. The dropping board should be tight and smooth; this will help much in keeping it clean.

The perches are 2 by 4 inch scantling, 12 feet long and are laid loosely on supports—flat side up. If these flat perches are sprinkled, top and bottom, occasionally with a good liquid lice killer you will have little trouble with lice.

We greatly prefer a double board floor, smooth, close and tight. If an earthen floor is preferred it should be rounded up, well covered with cinders and gravel and grouted with cement. This makes it rat proof, and this is about the only advantage it can claim. It has many disadvantages unless litter to cover it is very abundant.

There should be nothing on the floor of the house but straw from which the fowls should be compelled to scratch for their grain rations. If we allow any exception to this rule, it may be a dust-box in front of each window, 2 by 3 feet in size, one foot deep, and filled with finely screened coal ashes.

The nest boxes should be hung on the front wall, on each side of the window, and at least 1½ feet above the floor that the hens may scratch under them.

The best water vessel is an old fashioned, earthen-ware crock with

sloping sides, and holding two gallons. One crock serves for two compartments if it is set on a platform 1½ feet high that is located 1½ by 2 feet on each side of the partition. Being thus elevated the fowls cannot fill it with litter, and with its tapering sides it will not break if the water freezes in it. Glazed earthenware is much less liable to harbor disease germs than is galvanized iron or other metal used for drinking vessels. A crock of this kind is easily cleansed.

Your partitions may be of half inch boards or of wire netting. We prefer a combination, using the boards as far forward as the doors, also for the lower two feet of the front of the house, to prevent cockfighting, and the remainder of wire netting. The board partitions prevent draughts.

Before putting in your fowls it is well to spray every crack and corner, and especially the dropping board and perches, with a liquid lice killer. If you sprinkle the dropping board lightly with sand, fine coal ashes or land plaster it will make it easier cleaned. Never use lime with the manure. It sets free the ammonia, its most valuable element. Pure poultry manure properly used is worth one dollar per barrel.

As I said before, your poultry houses should face the south or east and if possible they should also face your own residence. The yards or run-ways for your fowls being at the front of the poultry house, you will be able to overlook the whole plant from your residence, thus enabling you to see all that is going on.

Of course you desire to give your breeding stock as much liberty as possible, but there are times when you wish to have the various pens separated from each other and absolutely under control. So we earnestly advise that you erect a yard for each of your four compartments. These yards need not be large—one rod wide and six rods long is ample. Yards Nos. 1 and 4 will project each 8 feet beyond the ends of the house and this is a good way to have them. In feeding, or in gathering your eggs you enter compartment one by way of yard one, and leave compartment 4 by way of yard 4. You thus are compelled to see every thing of all yards and compartments everytime you go through the house.

Having used a half dozen houses of the kind here described for five years, these houses ranging from 24 feet to 120 feet in length, having found that they meet all the requirements of this climate, having seen these houses built on scores of other farms, east, west, north and south, and in every case giving absolute satisfaction, the writer has no hesitancy in urging this house upon Pennsylvania farmers. Remember its leading features are: 1. Air tight at the top and back. 2. Low down at the top and back. If it is elevated two feet above the ground with an air tight floor, and if the glass windows are removed in summer and replaced by wire screens it becomes an admirable all-the-year-round house, warm in winter, cool in summer and dry all the time. Fowls twenty-five in each compartment on those perches well in the rear should never lose a comb or wattle in the severest weather.

3. THE FEEDING PROBLEM.

We have now come to a consideration of the third difficulty that usually stands in the way of the successful management of poultry

on the farm. We have already given some hints on this subject in comparing the farmer with the villager. The old saying: "The shoemaker's children go barefoot," applies here. Too often the farmer who grows the grain is the most injudicious feeder of that grain.

At the present time our leading grains can all be bought at one and one-half cents per pound—corn and oats for a trifle less. For the past three years corn, wheat and oats have averaged me a trifle more than the above named prices and I buy all my grains. The points I should like to make clear in this connection are: 1. The farmer can market these three grains at home to his own fowls and realize much more than these prices, besides retaining their manurial values on the farm. 2. If he does not produce all these grains at home it will pay him, just as it does me, to buy those he does not grow in order that he may have that variety of grain rations that will induce his fowls to eat the largest possible quantity of them. Not a week in the year passes that we do not feed some of each of these grains, indeed scarcely three days in succession.

And not a week in the year passes that we do not also feed other grains, sunflower, buckwheat, sorghum, kaffir corn, or popcorn.

Still further, not a week passes that we do not feed bran, chopped oats, corn meal or linseed meal, generally two or more of these each week.

And not a week passes that we do not feed some form of green food, cut clover, cut alfalfa, onions, cabbage, mangels or rape; generally several of these.

And once more, not a week in the year passes that we do not feed some form of animal food, green cut bones, dry cut bones, granulated beef scrap, meat meal or dried blood, generally several of these.

And, finally, not a week in the year passes that we do not feed oyster shells, mica-crystal grit and carefully screened fine gravel: generally these three things are before our fowls every day in the year.

Now why all this trouble and expense? Simply to stimulate the appetites and digestive organs of our fowls to a consumption of the largest possible quantity of these food elements that go to make bone and muscle and energy and eggs.

That old sinner who boasted in class-meeting that religion is free, that he had been a church member forty years and it had only cost him two dollars, received the right answer when the preacher retorted: "May God have mercy on your stingy soul!"

A hen, a pig, a steer, a cow—any of our meat-producing or milk-producing animals—are of value to the farmer only in proportion to their digestive and assimilative powers—only in proportion to their ability to convert a large quantity of the cheap, raw material into a correspondingly large quantity of the valuable finished product. And the more completely finished that product is the less of fertility it removes from the farm, and the more available fertility it leaves on the farm, the better.

The old time, common scrub cow could not consume more than five or six times her weight of the raw material in a year, and the returns she gave for this often brought the balance on the wrong side of the ledger. She was not bred to do any better. The modern Holstein cow bred for many generations on the lowlands of Holland

to consume a large quantity of the green food her owner grows and carries to her; the modern Jersey cow bred for a hundred years to consume the largest possible amount of rich food—each of these will consume a dozen times her own weight in a year, because she is bred to do that very thing. At the same time each of these cows will yield her owner a large profit over food cost, in the large quantity or rich quality of the milk she produces.

But the modern hen can surpass both cows not only in the proportionate quantity of food she consumes, but still more in the quantity and value of the return she makes. The five pound pullet, ready to lay, in one year can be made to consume 80 pounds of food "16 to 1," and her food may cost her owner $1.00—oftener less than more—but her returns of an egg each alternate day—180 eggs in the year—are worth at least three times the cost of her food and should sell so as to give her owner a clear profit of $2 per year above cost of food.

Every dairyman knows that it takes a good cow to give an income of $60 per year from a food cost of $30. That $30 fed to 30 pullets will more frequently give an income of $90, or double the profit yielded by the cow, and that, too, with less care, less labor, less drudgery on the part of the owner. And in all this calculation we have taken no account of the profitable returns the hen gives in the brood of chicks she will raise while resting from her egg-labors when eggs are cheap.

The writer has before him the records of a villager who sold eggs from a flock of eight hens to the amount of $3.73 per hen, all this within one year; and besides, this bunch of hens each raised a brood of chicks in summer time—seventy-five chicks coming to maturity, and the profits on these chicks above food cost was equal to the income from the eggs. In other words, the profits above food cost from these eight hens was more than $6 per hen.

Of course the best of care and attention was given and of course these eight hens were pure bred—bred to do that very thing, but all their products were reckoned at regular market prices; not fancy prices. This is the lesson we desire to impress on our Pennsylvania farmers: Good breeding, good feeding, good care will give good profits.

WHAT IS GOOD FEEDING?

We come now to a brief discussion of the question of feeds and feeding, and we repeat the statement made in another form: She is the most profitable hen that can be induced to consume the largest quantity of the properly proportioned foods. Since a chemical analysis of an egg and of a young roasting chicken is almost identical, we may say in the outset that there is little difference in feeding for eggs and feeding for flesh.

An egg is about two-thirds water, one-eighth albumen, one-tenth lime, and one-twelfth fat. It is the giving the hen the proper raw materials at the proper time that constitutes good feeding.

Hens suffer more from a lack of good pure fresh water than from almost any other cause. Even the hen at liberty is often compelled to drink the filthy water in the cow-tracks in the barnyard or do without. Such a supply of water will not produce many eggs of any kind, and none that are good.

The albumen of the egg—the white of the egg—is the protein, what we crave for when we desire lean meat. The hen must have the protein foods to make it—the oats, wheat, bran and meat. The lime for the shell she will get from the wheat, clover, oyster-shell and cut bone. The fat will come from all the grains, but especially from the corn—the carbo-hydrate food.

Without giving exact details, the writer would want his feed bins so proportioned that he could lay in supplies of food thus: Four bushels of bran, three bushels of oats, two bushels of wheat, one bushel of corn, one bushel of lean meat or beef-scrap, one bushel of cut bone and one bushel of oyster shells. In addition to these he would want before his hens a constant supply of clean, sharp granite or crystal grit. Coarse sand or very fine gravel will reduce the amount of grit used, but cannot take its place.

In addition to the foods named above, the egg-laying hen, likewise the growing chick, should have every day some form—better, several forms—of green food. The clover, grasses and weeds she picks up on the free range in June must be supplied in her confinement in January if she is to do June work. Finely cut alfalfa or clover, steamed, or wet with hot water, are excellent. A head of cabbage hung by the root in the pen is very good. Roots—especially mangels—supply both food and water to some extent. The hens in their pens become very fond of them and will consume large quantities of them. These roots can be grown at the rate of 20 to 30 tons per acre, and every stock breeder knows their value to sheep and cattle. The hens will pay for them even more liberally.

Good feeding means close observation and good judgment on the part of the feeder. The feed suitable in quality and quantity last week may not be suitable this week. The weather may have changed. If it has grown colder, not less of the wheat and oats but more of the corn and meat may be demanded.

Never mix your grains. Never feed exactly the same food two successive meals. Always stimulate the hens to eat more by giving them something different to tempt their appetites. The hen that is laying regularly is seldom liable to get too fat. Have a care that your pullets and your moulted hens have started to lay before you begin to feed too heavily in the fall. There is little danger after they have begun to lay.

The feeding problem is much simplified if females of different ages are not kept together. What is ideal for three year old hens may be entirely wrong for pullets. Separate and classify them by ages as closely as possible.

Better have hens a little hungry, eager for their food and willing to scratch for it, than to have them sitting around lazy, fat, livers torpid, eyes dull, combs pale. It is the active hen that is the egg-producing hen.

4. MARKETING THE PRODUCT.

So often has this topic been mentioned throughout this Bulletin that it seems superfluous to refer to it again. The great secret of good marketing is to have a uniform product, uniformly good. Three or four good hogs in a bunch of poor ones do not bring the price up, but three or four poor ones in a bunch of good ones always bring the price down. In selling you get only the price of the

poorest specimen in the lot, so it is always best to leave the poorest specimens to be sold by themselves. The good ones bring more without them than with them.

THE QUALITY OF EGGS.

In selling eggs, never combine some one elses with your own if you wish to gain and hold a high class trade. You cannot tell when or how often your neighbor gathers his eggs. One doubtful egg may ruin your trade with your best customer.

No egg that is fertilized, i. e., that is laid by a hen that is mated, is a strictly first-class egg. If the egg is fertilized the hen by fright or excitement may have retained it too long and its incubation may have proceeded so long within her body as to partially develop the germ. At any rate twelve hours elapse after fertilization, and this means twelve hours of incubation. After the egg is deposited in the nest—say in the morning—six or eight hours more of incubation may occur by other hens on the nest before the egg is gathered. The only first-class egg is the egg produced by the unmated hen. The unmated hen lays as many eggs as if she were mated.

Eggs are very susceptible to their surroundings. Fresh eggs are as easily tainted as fresh milk or fresh butter. Many people imagine that because an egg is encased in a shell it is impervious to its environments. Place a few fresh eggs with some bananas in a closed box over night and then notice the flavor and taste of the bananas on the eggs. If all environments of eggs were as unobjectionable as the bananas it would be different.

If eggs get soiled by hen tracks in the nest, cleanse them with a moist cloth and a piece of sapolio. Do not dip them in water. Remember an egg shell is porous.

MARKETING DRESSED POULTRY.

The first essential is to have the birds well fatted—not that greasy fat that lays in layers under the skin and in chunks upon the vital organs— but that delicate combination of fat and flesh which in beef butchers speak of as "well marbled." In fowls rather it is fiber upon fiber, tissue upon tissue of alternate flesh and fat that makes the very muscles stand apart instead of grinding upon each other.

This choice flesh is put on fowls not by feeding all the corn they can be induced to eat—that process gives the chunks and layers. Rather it is obtained best on both old and young birds by crate or confined fattening, using ground oats stirred into soured milk to the consistency of batter, feeding the birds all they will eat twice each day, withdrawing what they do not eat in a half hour and darkening the quarters until the next feeding time.

This process so softens the muscles and tendons of old birds that they will pass for youngsters. It gives a white skin and the appearance of white flesh even to birds of naturally a yellow skin. No food has been found to do this except the sour milk and ground oats.

The rapidity with which flesh can be added by this process is very remarkable. Vigorous, growing cockerels can be advanced from

3½ pounds to 5 pounds in three weeks. In some of the feeding districts, particularly in Missouri, New Jersey and Canada, it is not unusual to purchase these cockerels at ten cents per pound—35 cents each—and in three weeks sell them at 15 cents per pound or 75 cents each, a gain of 40 cents at a food cost of not to exceed 10 cents. The improvement in quality of the flesh is as remarkable as is the gain in quantity.

KILLING AND PLUCKING.

The first essential is that the fowl shall have absolutely no food for thirty-six hours so that its crop, gizzard and intestines shall be empty.

First-class dressing demands that the fowl be dry-picked—not scalded. This makes the French method of killing very essential. By this method the fowl is suspended by a loop around its legs to a hook on the wall. With a quick thrust through the roof of the mouth to the brain the operator kills the bird and severs the main arteries. At that instant he begins plucking the feathers. They pull easily then—a minute later they come hard, but in that one minute the worst of his task is done. The carcass is then cooled, formed in the forming troughs, so as to pack nicely and is then ready for shipment. No incission is made in the skin of the fowl. None of the interior organs were removed. The moment the interior of a fowl is exposed to the air, decomposition sets in. Packed or handled as described the fowl will keep perfectly for days, or if in cold storage for weeks or months.

Cooks and some housekeepers object to this method of dressing fowls; but the more intelligent know that it is the only safe and sanitary way of doing the work.

The English method differs only in the killing. No knife is used; no bleeding is done. The vertebra next to the skull is severed from the head by a strong quick jerk of the operator; this causes instant death and a loosening of the feathers as in the French method. The head is drawn out from the neck an inch or two, and into this space the blood drains and forms a clot as the bird hangs by its feet. This method shuts out the air from the interior of the carcass even more effectually than does the French method.

A serious onslaught has been made on these methods of dressing poultry in several states recently, but it is hoped that they may not prevail but rather that these methods may grow in favor. They are safer for the consumer; they are simpler and better for the producer.

ARTIFICIAL INCUBATION.

Occasionally, the question is still asked: "Are incubator-hatched chicks as strong and vigorous as those hatched by the hen?" If the incubator is properly managed we can see no difference. The machine may be allowed to run too hot sometime during the period of incubation; in such cases some chicks may hatch cripples, but this is the fault of the management not of the system.

Should farmers and their wives undertake to run incubators? Why not? There is nothing to prevent them from doing so as well as villagers and professionals. If they choose non-setting varieties, they must use incubators or resort to buying or borrowing broody

hens. This latter plan has its dangers. Thousands of farmers and their wives have managed incubators successfully for years. Their number is increasing every year. To one who enters the poultry business on a large scale, the incubator is an absolute necessity.

Can farmers succeed without incubators? Certainly they can and do, if they select a variety that will hatch and rear their young as most farmers do. With a convenient and properly arranged hatching room, many hens may be hatching at once and with probably less constant care than the incubator requires. All who do this should learn to test out and reject the infertile eggs at the end of the first week thus securing more economic service from the setting hens.

What are the special requirements of good incubator work?

1. A room of rather equable temperature and yet one that receives a good volume of fresh pure air. Several lamps in a room vitiate the atmosphere and prevent good hatching.

2. A room not too dry nor yet very damp. A dry, well ventilated cellar is probably the best. Any extreme in the presence or absence of moisture is troublesome in running an incubator.

3. Patient, frequent attention to the regulating of the machine at the start, to watching the temperature and moisture all the way through and to turning and cooling the eggs. Better to run the temperature considerably too low than a trifle too high. The former makes a slow hatch; the latter often produces no hatch.

4. A steady nerve and a positive determination not to open the machine after the process of hatching begins. This may cause the loss of a few chicks but it will prevent the loss of many.

BROODERS.

Where incubators are used, brooders are essential. Better buy your first brooder and study carefully the method of managing it; after that buy only the hover and heating apparatus and make the brooder box yourself.

The trouble with most boughten brooders is that they are too small. If large enough, they are expensive and freight charges are high. The box of an ordinary upright piano, thrown on its back makes an excellent brooder. Thus located it has a floor space of $5\frac{1}{2}$ feet square—twice as large as any boughten brooder. Let the low part of the bevel be the back, but extend this bevel clear to the front. This will make the front nearly 4 feet high—high enough to put in a window, 2 by $3\frac{1}{2}$ feet, on hinges, thus serving as a door for the attendant. One of the photographic pictures in this Bulletin shows some of these brooders in operation, also others converted into colony houses later in the season.

It is a good day's work to convert a piano box into a brooder, for the floor must be made tight and the entire box must be neatly covered with tarred paper so that the full benefit of the lamp's heat may be secured. The beauty of these large brooders is that you have a well heated portion at the back, but a large space in front in which the strong chicks may scratch and exercise when they do not need the heat of the hover.

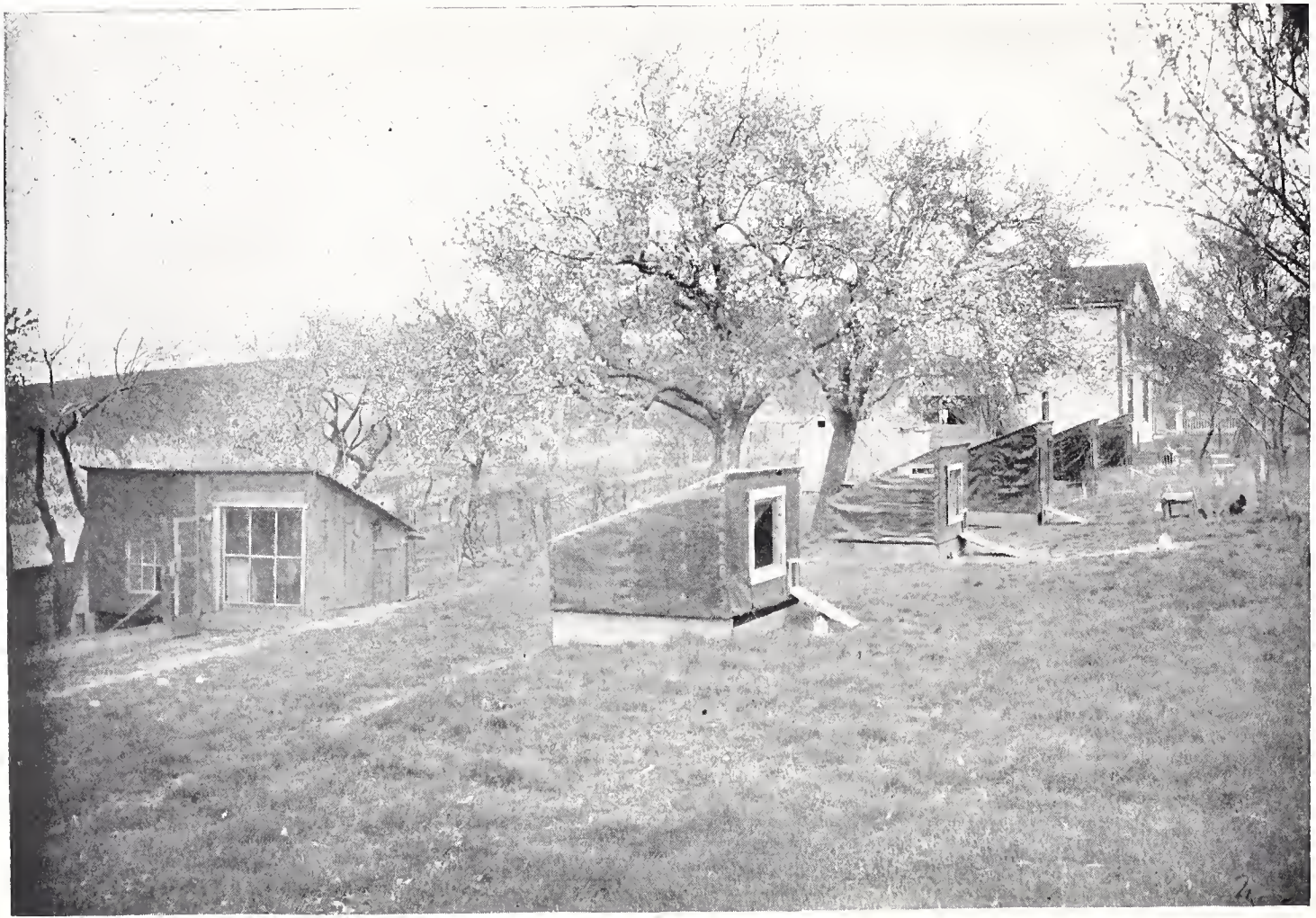


PHOTO No. 2. This shows the piano box brooders described on page 30 in operation. The apple trees were in full bloom at time of taking this photo. Later they furnished refreshing shade to the chicks during the hot weather.

PHOTO No. 3. This shows a row of Mr. Orr's piano box colony houses. Notice they are elevated one foot by the plank foundation connected by another plank in the middle at right angles to this. This gives shade and protection to the chicks at all hours of the day. See description page 31.

COLONY HOUSES.

When your chicks are eight to ten weeks old, unless this be in the early spring, they no longer need the hover, and may be transferred to a colony house, or the heating apparatus may be removed from their brooder and this converted into a colony house. Suppose you have succeeded in raising eighty chicks. When three to four months of age, they begin to fill even this large colony house. Then is a good time to separate the sexes. It should really be done as soon as the sex of the chicks can be determined. Forty will thrive and do well in such a house until cool weather, but they will do better if again divided and the culls are sold off.

When using these piano-box colony houses, it is well to raise them about a foot from the ground by a foundation of planks in the shape of the letter H. This allows the chicks a quick and safe retreat in time of a storm, and what is of more value, a shade in the heat of the day. If your colony house faces the east you will find them under the western side in the forenoons and under the eastern side in the afternoon. The plank midway makes the chicks always within easy reach—no small item when teaching them to come in at night.

About the time you separate the sexes it is well to put in the perches. They will never learn to roost so easily as at this time. We put in three slats, each 3 inches broad and 5½ feet long, and they soon learn to use them, and on such perches they never have crooked keels.

While in the brooders, the use of low, movable, wire fences in front of each brooder is advisable, but later in the season these should be dispensed with and the chicks encouraged to range freely.

FRUIT AND POULTRY.

This is a combination that cannot be commended too highly. Locate your poultry houses if possible so that the runs will be in an orchard. The fowls will destroy thousands of harmful insects, thus greatly benefiting the trees and increasing the prospects for fruit, and the fowls will gain great comfort and benefit by the protecting shade of the trees. Plum trees and cherry trees are especially benefited by the presence of the fowls about their roots. Peach trees will grow most rapidly and soonest give an abundant shade.

The writer and many of his visitors noted particularly during the summer of 1905, the advantages of having peach trees in the poultry yards. Trees within those yards, planted the spring of 1901, were twice as large and bore six times as much fruit as similar trees just outside those yards that were planted at the same time.

POULTRY DISEASES.

So little is really known on this subject that no one wishes to discuss it. Certain it is that there are many poultry diseases caused by internal parasites whose habits of life are yet but little understood. They attack all the vital organs, but especially the liver and intestines.

Expert veterinarians are studying the habits of the pests and to them we must look for our best help; but they are slow about declaring themselves positively.

DIARRHEA OR BOWEL TROUBLE.

There are two causes for this form of disease that will cover most cases:

In young chicks the trouble, nine times out of ten, is irregular or extreme temperature. The incubator-hatched and brooder-raised chick cannot endure an extreme of more than fifteen degrees. In the first two weeks of his life the limits should be 85 degrees and 100 degrees. In the next two weeks the range may be between 80 degrees and 95 degrees, and by that time the trouble is generally over.

The other cause is irregular or foolish feeding. The young chick should never have wet or sloppy food. Sweet milk and sour milk are both good. Souring milk is always bad; hence milk should be fed in clean vessels and these be promptly removed and thoroughly cleansed. Filthy drinking vessels are a fruitful source of bowel trouble.

GAPES.

This is one of the most common poultry troubles. The germ hatched from an egg deposited in the earth the previous season is picked up by the chick. It soon develops into a slender wire like, worm which attaches itself to the inside of the trachea or windpipe. One would do no harm, but several there soon grow so large as to clog the air passage and cause the chick to gasp spasmodically for air. A looped horse hair may remove them. A feather dipped in turpentine inserted in the windpipe will usually dislodge them but it may kill the chick. Turpentine or its fumes is an enemy to the gape worm. A little of it rubbed on the outside will often dislodge them. A few drops of it in the drinking water is said to prevent them.

Chicks hatched in incubators and reared in brooders with several inches of sand covering the soil, will seldom have the gapes. There is no zoological connection between the common earth-worm and the gape worm, but the former may and no doubt does, carry the germ of the latter into the body of the chick.

ROUP.

This is simply a catarrhal cold allowed to progress until it becomes chronic. In its later stages it is contagious. The atmosphere of a roupy coop will carry the disease germs to healthy chicks, but the disease is most commonly carried by the drinking vessels.

Avoid draughts. There is far more danger in a draughty house than for the fowls to roost at night on the limbs of the trees. Remove the affected birds at the first symptoms. Give them warm but well ventilated quarters and feed them heavily on highly seasoned or stimulating food.

It is difficult to treat the roup. A small oil can with a rubber tube may be inserted in each nostril and some simple cleansing fluid squirted into the nosal passages. The same process applied to the slot in the roof of the mouth will do some good, but the trouble is in reaching the intricate passages of the head where the real trouble is located. The best results the writer has had have been in dipping

the head of the fowl into the remedy for a second or two, causing it to gasp and almost strangle, but these spasmodic efforts sends the medicine where it will do the most good.

FOWL CHOLERA.

This is a very rare disease. Many other diseases of a dysinteric or tuberculous nature have quite the same symptoms and are often mistaken for cholera. When cholera really occurs there is no known remedy. All that can be done is to stamp out the disease by burning or burying very deep the bodies of all affected specimens—and the entire flock is likely to be included. Then by a thorough cleaning or burning of everything movable and a soaking of the walls and floors of the house, and also of the soil of the yards, with a strong disinfectant the plague may be exterminated.

TUBERCULOUS LIVER.

This disease is but little understood. It is very common among fowls and turkey, often being called Black Head, because the comb turns black. It may start in some instances, simply as indigestion from excessive or improper food. A congestion or swelling of the liver is noticed in the early stages, but later this organ breaks out in ulcerous spots and then breaks down and the fowl having suffered starvation, dies. Whether this disease is connected with the tuberculous condition of the intestines and other organs is not yet fully known.

There is no positive cure for these tuberculous troubles. These and several other diseases of fowls are known to have their origin in germs and parasites whose nature and habits are yet imperfectly understood. Sanitary quarters and care, wholesome food and pure water, removal of sick birds from the flock at the first indication of disease are about the only methods of remaining fairly free from their ravages.

EXTERNAL PARASITES.

Lice can scarcely be called a disease of fowls, but they are the worst enemy the farmer has to contend with. No less than two dozen different kinds of lice infest our domestic animals and we have seen four kinds on one fowl. The large body louse found so commonly in the fluff of mature fowls is far the most numerous, but not the most damaging. If a good dust bath is supplied, or if liquid lice killers are used freely about the perches, they are easily kept in subjection. This louse does not draw the blood of the fowl, it feeds upon the feathers and the exterior skin, but when very numerous becomes so annoying as to drive the hen from her nest.

A blood-sucking louse, seen in one stage of his existence as a long slender fellow in the neck and wing feathers, is a serious enemy. It is believed that this is the parent of the blood-sucking louse that attacks the head and throat of the little chick. If this is true, it is very important that the setting hen be freed from his presence before her chicks hatch.

For the head and throat louse when it once is located upon the little chick, the best treatment is carbolated vaseline applied to the

parts with the finger. Many insist that simply greasing the head with lard is sufficient. Lice do not like either grease or carbon oil, but neither of these elements are deadly to lice. Carbolic treatments are.

The worst louse of them all is the little red mite that may be found in daytime on the under side of the perches or in nearby cracks or corners. Draw the end of your finger through a bunch of these mites and you leave a bloody track—the life blood of your fowls. They go on the fowls only at night. Enter the house suddenly with a lantern, take up some of your fowls in your hands, and in a few minutes you will feel these villains crawling over you. They are simply trying to escape from their nightly feeding grounds to their daily resting places.

For the setting hen the lice powder is easiest and safest. For all others the liquid lice killer is simplest and best. The liquid lice killer must not be applied to the plumage of the setting hen, nor about the nests when hens are laying. It is so strong and pungent that it may prevent the eggs from hatching and it will surely taint the fresh egg that comes in close contact with it.

The liquid lice killer may safely be sprayed about and into the empty nest boxes, and in the coops to contain the little chicks, but these must be ventilated for some hours before being used. It may be sprayed, or even sprinkled, about the perches and dropping boards of the poultry houses, and when the red mites are found it should be used freely, especially on the under side of the perches. For this reason we earnestly recommend the broad perches laid loose and flat so as to easily reach and exterminate these little pests of the poultry house.

TURKEYS ON THE FARM.

In many sections, turkey raising furnishes no small income to farmers and farmer's wives. Turkeys always command a good price from October to March, and once started, the young turkey on the farm is able to gain most of his own living from the insect life he delights in capturing in his wanderings.

Our Standard recognizes six varieties of turkeys: Bronze, White, Black, Naragansett, Slate and Buff. We have named them in the order of their popularity, but we believe there are more of the Bronze variety than of all others combined.

The Bronze is most closely related to the wild turkey of our father's day—still to be found occasionally in the mountain regions of Pennsylvania and West Virginia. For infusing new blood into Bronze flocks, wild turkeys are much in demand. Bronze turkeys are the largest of all, 36 pounds being the standard requirement for adult males, 20 pounds for hens.

The writer is strongly of the opinion that turkey breeders are giving too much attention to extreme size. Our shows sometimes bring out males of 56 pounds and females of 30 pounds. These very large birds do not sell so readily in market as do smaller specimens. For a breeding male bird we prefer one that will never exceed standard weight, but he should be extra fine in shape, style, vigor and coloring. It requires no more feed to grow two young turkeys that weigh 15 pounds each at Thanksgiving time than one to weigh

30 pounds later, and on the market the two will bring the most money. Where one family will select a turkey dressing 20 pounds, ten families will choose one weighing 10 or 12 pounds.

Of the remaining varieties named, the White, Slate and Buff varieties seem to possess less of the characteristics of the wild turkey. They are more domestic in their habits, more easily controlled and less likely to wander away and get lost. The writer is also of the opinion that these varieties—especially the Whites—have a finer-grained flesh and a more delicate flavor.

The mating and rearing of turkeys is quite an art. The limits of this Bulletin will not permit their discussion at length. We shall content ourselves here with a few hints:

Select healthy stock. Do not cross the varieties; breed each variety pure, you will be able to sell youngsters for breeding at an advance over market prices. Better get your males from one section and your females from another, so as to be sure you are not breeding too closely. Two year old hens and yearling males do better than mating pullets to adult males. We prefer adults of both sexes. The same breeders can be kept several years with better results than when using young stock.

The most successful turkey raisers allow the hens to do the work almost entirely unaided. If you can keep your hens laying and have kept the eggs carefully, when a turkey hen begins to set seven or nine eggs can be set at the same time under a common hen. The turkey hen will care for all the chicks that both can hatch. If the little turks hatch strong and the mother hen seems to be shifty—and here old hens are wiser than young ones, let her have her own way, she will generally do better than if you attempt to control and regulate her. Some turkey raisers succeed best by confining the young turkeys in a yard fenced in with boards two feet high, and having in the yard a shed or low roof for their protection.

Young turkeys are very liable to have lice, especially the head lice. If your hens are quiet, catch and dust them thoroughly while setting. If the youngsters seem weak and listless at two weeks old, the answer is usually "lice." Anoint them at head, throat and vent with carbolated vaseline.

The best feed for young turkeys is the same as for chickens—chiefly the grains, and feed dry. Avoid sloppy food. Don't forget something green every day, also some finely cut cooked lean meat—if you have them confined. Remember this is what they would get if at liberty. At two months of age the worst time is over with turkeys, and then it is best to give them their liberty with the mother hen. Encourage them to come home to roost by liberal feeding in the evenings. Watch that they do not wander too far and fall victims to their many enemies.

Don't sell your turkeys in the Fall for just what the first huckster offers you. Most people sell at Thanksgiving. Three weeks later the price is usually higher. Get a customer of your own if possible and ship to him direct. If he is an intelligent man he will want you to kill and dress them by the French method already described. Be sure that they have no food for 36 hours before killing. Leave on the long or primary wing feathers.

GEESE AND DUCKS ON THE FARM.

In some sections, goose farming is profitable. We do not advise the ordinary farmer to raise geese unless he has peculiar surroundings for doing so, and has had experience in the business. In France, goose livers bring more than the entire carcass does here, but the American market for goose livers is as yet undeveloped.

Duck raising can be made profitable, especially if one is near the large eastern markets where duckling broilers and green roasters command high prices. The duck business is a trade by itself; still many farmers raise annually a dozen or two of ducks at a very small outlay, especially if they have some low marshy land where they feed much of the time.

If you start in the duck business, raise only one kind. The Pekin and Aylesbury varieties are most popular. Both are white. The Rouens are the most handsomely marked and are equally as good for table use, though not so well known as the Pekins. The way to raise large ducks is to feed heavily. A young duck has an enormous appetite and if fed all it can consume about five times a day, the rapidity of its growth is astounding. At laying time the ducks must be confined to the pens each day until they have laid their eggs or they will drop them anywhere, even in the water. As a rule, the duck that is laying will deposit her egg in the nest or drop it in the litter in the early morning. As both geese and ducks are somewhat quarrelsome in the poultry yard, it is not generally advisable to raise water fowl along with chickens and turkeys. A special place where particular attention can be given them is usually essential to success.